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VIRTUAL CUSTOMER SATISFACTION: A SERVICE MANAGEMENT PERSPECTIVE

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Abstract

We propose viewing Electronic Commerce through the lens of service management in order to identify and explain possible determinants of customer satisfaction. By applying the philosophy of Grounded Theory in the first investigative phase, we identified two potential drivers of satisfaction: the user's perception of technical competence and the user's perception of control over the process outcome. Employing Structural Equation Modeling, we assess the significance of the relationship between these two new constructs as well as the traditional ones of value and service delivery system to user (customer) satisfaction.

Keywords: Electronic commerce, customer satisfaction, service management

Introduction

Electronic Commerce (EC) is revolutionizing the way business is conducted and, indeed, the Internet activities of e-mail and online commerce are often credited with being the primary source of the current historic economic expansion in the United States.¹ What is novel about these activities is not their function; rather, it is their form. The Internet is providing a new means for customers and firms to interact. This new interface - the firm's website - has several characteristics that are uncommon to the traditional forms of buyer/seller interaction (e.g. face-to-face, telephone, facsimile, and mail). Without the direct involvement of another human being, the EC interface enables a consumer to (1) locate a product or service (2) assess its utility, and (3) purchase it whenever and practically wherever it is convenient. Yet, a recent survey indicates that 36% of online customers are not satisfied with the interaction.²

The promise of EC depends upon user interfaces and how people interact with computers (Hoque and Lohse, 1999). The web has become an important point of contact with customers for many companies. Service has been described as one of the most important attributes for online business to influence traffic and sales (Lohse and Spiller, 1998). Can the corpus of knowledge on traditional service management be utilized to improve customer satisfaction in EC?

Services are similar to EC in that both are processes by which value can be added to something or someone. In this paper, we propose viewing this new interface between buyers and sellers (the website) through the lens of service management in order to identify and explain possible determinants of customer satisfaction in the virtual realm. Our objective is to identify and evaluate the significance of the *electronic* Service Delivery System (eSDS) interface in terms of causality of the level of Customer Satisfaction. This research examines characteristics on both sides of the interface by seeking the answers to the questions: (1) why are some firms more successful with EC? (2) How does a firm's website affect its relationship with its customers? (3) How does the uniqueness of each customer affect a website?

¹Helm, Leslie (1999, June 30). Productivity jumps with help from net. *Los Angeles Times*, pp. A1, A12, A13.

²Lehman, DeWayne (2000, March 17). Study: e-customers are mostly dissatisfied, *Computerworld*, accessed March 19, 2000 (<http://www.computerworld.com/home/print.nsf/CWFlash/000317CA32>).

Literature Review

The Service-Profit Chain (Heskett et al. 1994) hypothesizes relationships between the Service Delivery System, SDS, (internal service quality, employee satisfaction, retention, and productivity), customer satisfaction, and profitability. In summary, profit and growth results from customer loyalty, which develops from customer satisfaction. Figure 1 presents the Service-Profit Chain and its relational links.

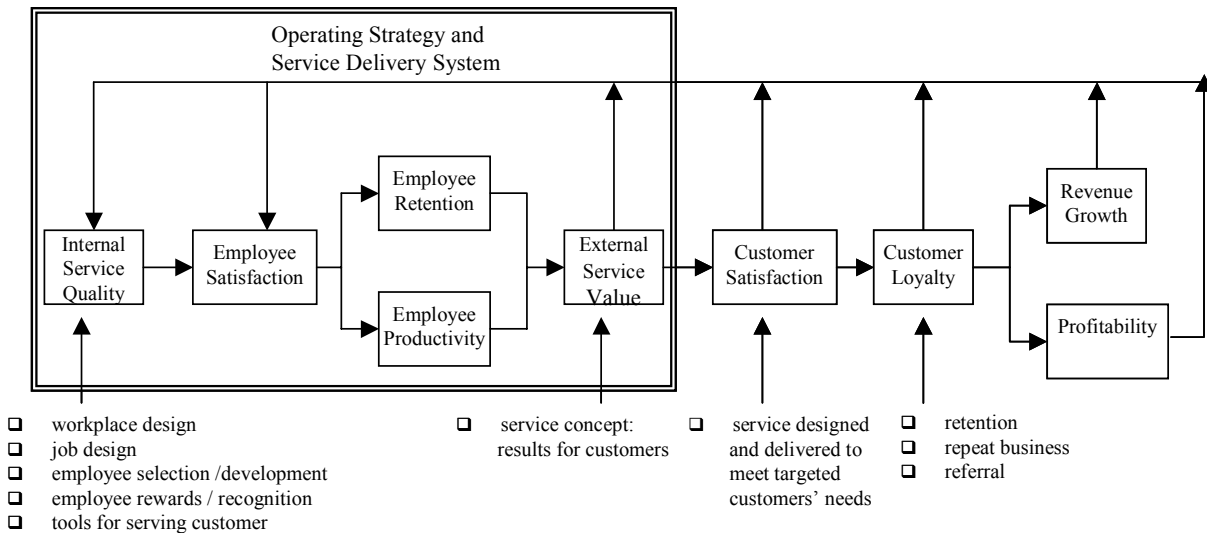


Figure 1. The Service Profit Chain

Prior research on the provider/client interface in the Operations Management and Marketing streams have focused on degree of contact and the relational aspects. From the Operations Management perspective, Contact Theory (Chase, 1978, 1981; Chase & Tansik, 1983) proffers Customer Contact as a significant variable affecting performance. In essence, as direct contact decreases between the customer and the SDS, the potential increases for the system to operate at optimum. Empirical research (Kellogg & Chase, 1995) resolved the Customer Contact construct into the variables of Communication Time (customer/server communication duration), Intimacy (customer/server confiding and trust), and Information Richness (type of communications mode, e.g. face-to-face, or written).

The theories of customer perceptions of service, the driver of satisfaction, have been developed in the Marketing literature. SERVQUAL (Parasuraman et al. 1988; 1994) assess the gap between customer’s perceptions and expectations of service quality or the Service-Profit Chain’s External Service Value construct. Cronin and Taylor (1992; 1994) have presented the SERVPERF instrument, which measures only customer perception of quality, as a sufficient measure of value. Providing an empirical bridge connecting the provider’s perspective to that of the customer, Soteriou and Chase (1998) link Communication Time to Reliability, Assurance and Responsiveness as well as Intimacy to those three variables and Empathy. Evidence to support the relational linkages between External Service Value, Customer Satisfaction and Loyalty has been provided by an examination of the consequences of the customer perception/expectation gap (Zeithaml et al. 1996).

An affirmative service encounter leads to an ongoing relationship that satisfies both the service and social needs of the customer. This, in turn, leads to the development of customer loyalty to the provider (Czepiel, 1990). Locke (1996) provides anecdotal support for provider/client bonding with her observations of the interplay between attending physicians, patients and their families. Czepiel (1990) argues that face-to-face contact is the most effective mode to facilitate development of social interaction and customer loyalty. The effects of personalization (the nature of this interpersonal interaction) on customer perceptions of service quality have been examined empirically (Mittal & Lassar, 1996). Personalization was found to significantly influence perceived service quality with a greater extent over services performed on the customer compared to services performed on possessions.

To include the possibility of technology and business processes having a greater significance than human interaction on value and profits, we consider the Roth and Jackson III (1995) empirical model developed by relating generic operations Capabilities to Service Quality to Performance – the C-SQ-P model. We view operations capabilities as analogous to the SDS. Surveying the retail banking sector, Roth and Jackson III (1995) provided evidence that both “factor productivity” and “service quality” are significant determinants of “market performance”. Their research also determined that “quality of customer interface” (process

capabilities) had a greater impact upon “service quality” than “knowledge” (people capabilities). Factor productivity was found to negatively affect service quality.

In addition to the variability of inputs brought to the service interaction by the customer, the service process (holistically as well as in terms of its component steps) may be capable of producing a range of outputs. “Standardized” indicates a non-varying sequential process with consistent and uniform outcomes. “Customized” connotes some capability to modify the service process in order to provide a specific outcome for a specific customer (Shostack, 1987). In order to describe a service process, Shostack (1987) provides the terms “Complexity” to indicate the number of steps and sequences and “divergence” to indicate the designed (or allowed) variability of each of those steps and sequences. From these definitions and the theories of Service Management presented, we develop our first three propositions:

- P1 Because of minimal intimacy and information richness provided by an eSDS interface, in order to maintain customer satisfaction, enterprises will employ additional mode(s) of customer contact as:
 - (a) The divergence of the website increases, and as
 - (b) The complexity of the website increases.

- P2 The social distance created by an eSDS interface amplifies the importance of the social aspects of the service encounter/relationship for customer satisfaction as:
 - (a) The divergence of the website increases,
 - (b) The complexity of the website increases, and as
 - (c) The object of the transaction becomes more personal to the user.

- P3 The degree of standardization and the frequency of usage of an eSDS interface determine the significance of the social aspects of the interaction for customer satisfaction.

We consider any divergence in the service process that is unintended to be an error and a potential source of dissatisfaction. Stewart and Chase (1999) identify the types of error providers and customers are likely to make. It was observed that rule-based and skill-based errors were the major sources of dissatisfaction in services. A rule-based error is the selection of a rule when a complete and objective analysis would indicate another rule is appropriate. A skill-based error is a failure to apply existing skills and usually is the result of a distraction that disrupts the skill-based routine. Relating these empirical findings to the heretofore-mentioned theories is our final proposition:

- P4 Complementing an eSDS interface with the social aspects of the service interaction in an eSDS will facilitate recovery from both rule-based and skill-based provider errors and increase both employee and customer satisfaction.

First Phase of the Investigation: Qualitative Research

The exploratory survey instrument is composed of 31 open-ended questions that inquire into the variables identified in the Background and Theory section as well as 14 closed-ended questions characterizing the enterprise in terms of customization, personalization, proportion of “front office” employees, customer involvement, and revenue generated. Table 1a summarizes the subjects’ self-perceptions with respect to the constructs identified in the literature review.

Five organizations were selected as the case studies: a travel agency, a language school, a mortgage company, a day trading company, and a virtual traffic school. The selection of these firms was based upon their willingness to participate and the maximization of the group’s diversity in terms of business strategies, output bundle composition, potential frequency of purchase, and firm size. We have summarized these descriptive criteria in Table 1b.

Support for our propositions can be found by comparing the enterprises interviewed for this study. The propositions focus on the eSDS interface attribute of variation with the Travel Agency representing one end of the spectrum having high divergence and customization. At the other end of the spectrum reside the Virtual Day Trading Company, the Virtual Traffic Course Company, and the Mortgage Company. All three have standardized the service delivery process by specifying steps and their sequence to provide fundamentally the same bundle to every customer. All three have reported the Internet as essentially the exclusive mode of customer contact (not just the primary mode) with little customer dissatisfaction. By viewing the social aspects of the service interaction as an aggregate, which we term “Interactivity”, we collect the concepts and constructs of Contact Theory, their linkages to SERVQUAL, and personalization into one variable.

Table 1a: Subject/Construct Matrix

Theoretical Construct	Travel Agency	Language Resources Company	Mortgage Company	Virtual Traffic Course Co.	Day Trading Academy
Contact					
Communication Time	Large Variation	Low Variation	Medium Variation	Low Variation	Large Variation
Intimacy	High	Low	High	Low	High
Information Richness	Large Variation	Low Variation	Large Variation	Low Variation	Large Variation
Quality					
Tangibles	Low	Low	Low	Low	High
Reliability	High	High	High	High	High
Responsiveness	High	Low	Medium	High	High
Assurance	High	Low	High	Low	High
Empathy	High	Low	High	Low	High
Social Distance	Small	Large	Medium	Large	Small
Personalization	High	Low	Medium	Low	High
Quality of Customer Interface	Medium	High	High	High	High
Customization	Large Variation	Low	Low	Low	Large Variation
Complexity	Large Variation	Medium	Low	Low	Large Variation
Divergence	Large Variation	Low	Medium	Low	Large Variation
Error					
Rule Based	Low	Low	High	Low	High
Skill Based	Low	Low	Low	Low	High

Table 1b: Descriptive Criteria Matrix

Demographics	Travel Agency	Language Resources Company	Mortgage Company	Virtual Traffic Course Co.	Day Trading Academy
Business Strategy	Traditional	Transition	Transition	EC	Hybrid
Output Bundle Composition	Service Information	Product Service Information	Service Information	Service Information	Service Information
Time between Purchases	Weeks	Months	Years	Years	No Repurchase
Bundle Number	4	80	5	2	4
Customer Number	300	5400	80,000	Decline to Answer	600
Front Office Employees	4 100%	5 50%	400 25%	Decline to Answer	30 100%
Average Service Time	30 minutes or 1 week	3 minutes	30 Days	Decline to Answer	10 Days
Customer Co-production	High	None	Medium	Decline to Answer	High
Gross Profit/Revenue	40%	45%	Loss	Decline to Answer	30%
Monthly Revenue	\$10-50k	\$100-250k	\$511k	Decline to Answer	\$100-250k
Repeat Customers	75%	23%	30%	Decline to Answer	N.A.
Referred Customers	50%	Unknown	Unknown	Decline to Answer	10%

By applying the philosophy of Grounded Theory (Glasser and Strauss, 1967) to our conversations with the study participants on their impressions of their customer’s reactions to their SDS, we believe there are two aspects of the customer interaction that are influenced by the eSDS interface and in turn significantly influence customer satisfaction. The first is the degree of perceived control the customer has to determine the outcome of the process. The second is the perceived required level of customer technical competency or perceived mastery. Therefore, we hypothesize:

- H1a: Satisfaction is positively correlated to the user’s perceived level of control.
- H1b: The user’s perceived level of control is negatively correlated to the eSDS interface (website).
- H2a: Satisfaction is positively correlated to value.
- H2b: Value is negatively correlated to the eSDS interface (website).
- H2c: Perceived service quality is negatively correlated with the eSDS interface (website).
- H3a: Satisfaction is negatively correlated to the user’s perceived level of mastery.
- H3b: The user’s perceived level of mastery is negatively correlated to the eSDS interface (website).
- H4: Satisfaction is negatively correlated to the eSDS interface (website).
- H5a: Interactivity moderates the relationship between the user’s perceived level of control and Satisfaction .
- H5b: Interactivity moderates the relationship between the eSDS interface and the perceived level of control.
- H5c: Interactivity moderates the relationship between value and Satisfaction .
- H5d: Interactivity moderates the relationship between the eSDS interface and value.
- H5e: Interactivity moderates the relationship between the user’s perceived level of mastery and Satisfaction .
- H5f: Interactivity moderates the relationship between the eSDS interface and the perceived level of mastery.
- H5g: Interactivity moderates the relationship between the eSDS and Satisfaction .

Figure 2 presents our model relating the contact interface to Customer Satisfaction based upon our case studies. We have expanded upon the Service Profit Chain by proposing variables that capture the effects of the customer’s co-production and the effects of the SDS. In the model we consider the effects of the service provider’s employees to be indirect and of secondary importance to that of the customer’s co-production and the SDS.

Second Phase of the Investigation: Empirical Confirmation

Next, relying upon extant service instruments and concepts, we developed an instrument to measure our constructs. Through pilot testing, we substantiated the validity of the measures; confirm the reliability of the construct indices; and eliminate redundant questions. The complete statistical analysis is available upon request. Figure 3 depicts the hypothesized variables and constructs. In this phase of our research, we have controlled out the construct of Interactivity by not allowing any human interactions (i.e. communications) between the survey respondent and the firm deploying the website visited.

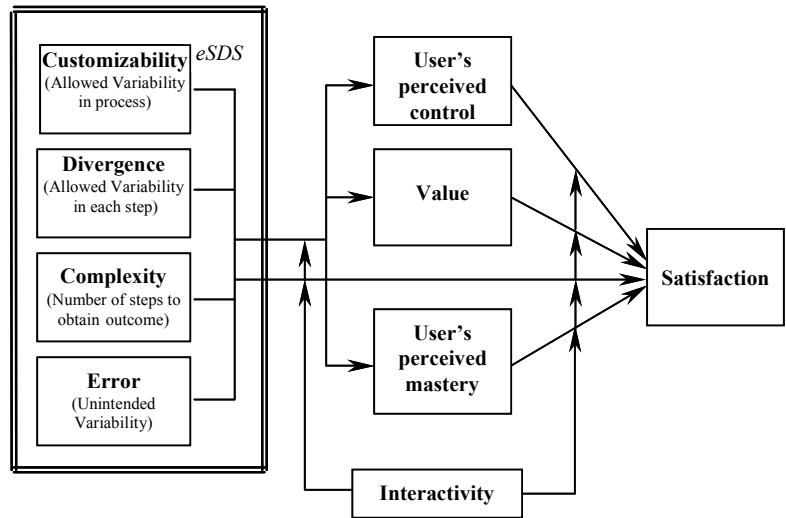


Figure 2. eSDS Interface Drivers of Customer Satisfaction

The general research question guiding this phase asks how the characteristics of a firm’s electronic SDS interface affect the customer’s satisfaction and perception of value. The general hypothesis is that the eSDS interface reduces customer satisfaction and perceived value unless it has been optimized. The specific questions this investigation addresses are as follows. How does the user mastery affect customer satisfaction? How does user control affect customer satisfaction? How do certain attributes of the eSDS interface (Customizability, Divergence, Complexity, and Error) affect perceived control, perceived value, perceived mastery

and satisfaction? Based upon the findings of the qualitative research, we proffer hypotheses *H1* through *H4* to answer these specific research questions.

Methodology

In an effort to provide reliability, the instrument relied upon existing measures (SERVQUAL and SERPERF), reverse questions, single barrel questions, the test-retest method, and pretesting of the questionnaire. Sudman and Bradburn (p 281-2) provide a comprehensive list of 18 steps for survey development, which are the bases of our design. The instrument was composed of five sections: free response, a modified SERVQUAL/SERPERF instrument (7 point Likert scale), construct questions (100 point scale), and demographic questions. The questions consisted of two open-ended and 78 closed-ended questions (including 11 demographic questions).

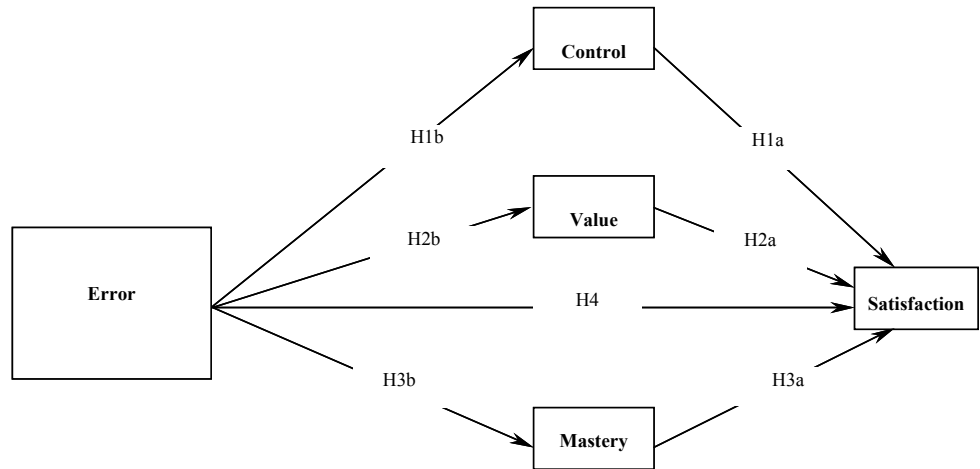


Figure 3. Research Hypotheses

To empirically confirm these hypotheses, this investigation examined the relationships between these constructs by having participants visit one of six websites with the purpose of purchasing one of three products. The websites were selected to maximize the variation in the eSDS interface attributes. After the participants completed an encounter with the website, a survey instrument was self-administered to assess satisfaction, eSDS, as well as the perceptions of mastery, control and value.

The study population and study frame were students enrolled in the Marshall School of Business at the University of Southern California. The sampling design relied upon available subjects. Surveys were distributed to both undergraduate and graduate students in three Information & Operation Management courses. The response rate of 79.9% is sufficient to allay concerns over the possibility of the non-response distribution differing from that of the response distribution.

Factor analysis was utilized to determine the extent of validity, reliability, data reduction, and questionnaire simplification. Elaboration analysis was employed to rule out confounding factors (e.g. price, product, modem speed, extent of Internet access, etc.).

Data Analysis

All measurements of the constructs are based upon the respondent’s opinions. Unknown factors (e.g. traffic volume on the Internet, the customer’s ISP as well as any intermediaries’ technologies), which neither the website nor the customer can control, may have an influence. We are relying on a large sample size to mitigate any unknown factor through the Central Limit Theorem of statistics. In essence, we assume that any noise (i.e. effect by unknown factors) will be constant enabling us to measure the effects of the constructs by examining a heterogeneous sample. SPSS for Windows, Release 7.5.1 was the statistical package employed for data analysis, which included examining the correlation matrix, factor analysis of the questions, and the Cronbach’s alpha for each index. LISREL8 was the structural equation model (SEM) package utilized to determine relationships among the constructs.

Data Characteristics and Sample Size

56 questions recorded responses as ordinal data and 10 questions recorded responses as continuous data. 104 surveys formed the data set for the analysis reported herein. Of these surveys, 19 were missing data; by imputation, the effective sample size was increased to 100. Missing data was only 0.03% of the total. Guidelines for adequate sample size under the assumption of normal distribution theory call for a ratio between 5:1 and 10:1 of cases to parameters to be estimated (Baumgartner and Homburg, 1996). The presence of Skewness and/or Kurtosis in the distribution of the ordinal data adversely affects several of the tests for statistical significance when using the Maximum Likelihood Estimator (Bollen, 1989). The preferred method of estimation for ordinal data is the Weighted Least Squares with the weight matrix being the inverse of the asymptotic covariance matrix, ACM (Jöreskog and Sörbom, 1996). Jöreskog and Sörbom state the minimum sample size is a function of the number of variables, k: $k(k-1)/2$. For our sample size of 100, the maximum number of variables that an ACM can be estimated for is 14, which would be less than 3

variables for each construct in the model. To avoid local identification issues in SEM at least 4 measures for each construct should be employed. Therefore, analysis will be based upon the Maximum Likelihood Estimator with transformations of the variables to minimize the affects of Skewness and Kurtosis.

Validity/Reliability

Face (content) validity for the Value construct is supported by the usage of an extant instrument, SERVQUAL. Correlations and confirmatory factor analysis were utilized to assess convergent and discriminant validity of the construct measures. Reliability was evaluated by Cronbach’s alpha for each construct index of measures.

Data Examination

Preliminary analysis of the responses to the 66 questions indicated 9 distributions were skewed (another 14 could not be ruled out) and 13 distributions exhibited Kurtosis (with 15 others being likely). Because confirmatory factor analysis failed to provide evidence of the measurement model corresponding to the data, exploratory factor analysis was undertaken. With the exception of Value, the data provided indications of two underlying factors for each construct with the majority of measures loading on both. The SERVQUAL question data indicated an expected four factors, but the measures did not load as hypothesized. Therefore, indices of summated scores were formed for each construct. Because of the increased number of divisions within each index, the data approaches the characteristics of continuous data. Since the probabilities of zero Skewness, zero Kurtosis, and zero Skewness and Kurtosis were low and the QQ plots indicated departures from normality, transformations were evaluated (Hair et al. 1998). Only the distribution for Value was affected with a natural log transformation providing slightly better results than a square root transformation based upon the QQ plots. Examination of the scatterplots for the indices indicated the possibility of two cases (101 and 104) being influential outliers. Heteroscedasticity was observed in the plots containing the Experience index and unfortunately could not be corrected by various transformations. Across the websites, the dependent index, Satisfaction ($F_{5,102} = 3.482$; $p = 0.006$) as well as the indices for eSDS ($F_{5,98} = 2.445$; $p = 0.040$) and Value ($F_{5,91} = 2.620$; $p = 0.030$) were found to be significantly different. Across products, none of the indices were found to significantly differ.

Structural Equation Models

Development

Baumgartner and Homburg (1996) address the use of indices composed of summated scores in SEM. de Ruyter and Wetzels (2000) cite numerous articles employing this approach as evidence of its acceptance in a variety of academic disciplines. Furthermore, these authors cite Netemeyer, Johnston, and Burton (1990) as reporting this approach as providing the same results as models with multiple indicators. The selection of this approach was determined by the limitations of the data for creating distinct multiple indicators of the latent constructs.

The basic model is constructed with the error variance of the measurement variable, either d or e, fixed at 1 less the index reliability coefficient (1- a). The path, l^y or l^x from the latent variable (either h or x), is fixed at the square root of the index reliability coefficient, \sqrt{a} (Baumgartner and Homburg, 1996; James et al. 1982; Kenny, 1979; Loehlin, 1987 as cited in de Ruyter and Wetzels, 2000).

The correlation matrix for the data without the potential outliers resulted in only minor changes (reported in the third decimal point) to the model statistics for the proposed model compared to the results for the correlation matrix for all the data. Therefore, the cases were retained for the analysis.

In addition to the Proposed Model, five alternative models were examined. Alternate Model I modifies the Proposed Model by deleting the paths from all latent variables save Value to Satisfaction. This alternate closely models the Service Profit Chain. Alternate Model II incorporates the modifications generated for the Proposed Model. The remaining models explore the possibility that Satisfaction leads to perceived Value. By interchanging the two constructs, Alternate Models III, is analogous to the Proposed Model and Alternate Models IVa, and IVb correspond to Alternate Model I.

Evaluation

Table 2 summarizes the significant paths and the statistics for each model. Using the guidelines presented by Bryne (1998) each of the models can be assessed statistically and the direction and significance of the paths are considered from a theoretical perspective (Since the article size limits do not permit thorough explanation of the statistics herein, the reader is referred to Bollen, 1989; Bryne, 1998; Jöreskog and Sörbom, 1996). From a statistical perspective, Alternate Models I and III poorly fit to the data by failing to attain any of the criteria. The Proposed Model and Alternate Model IVa provide comparable fits. Alternate Model II fits better and finally Alternate Model IVb provides the best statistical fit (Bolded numbers indicate attainment of associated

guideline). However, from a theoretical perspective, Alternate Models IVa and IVb, which indicate that as Satisfaction increases perceived Value decreases, are illogical. Although not determined to be significant, Alternate Model II, which indicates that an increase in perceived Value increases both user’s mastery required and user’s control, cannot be support from either a logical or theoretical position. Therefore, the Proposed Model provides the most reasonable interpretation of the data.

Table 2. SEM Statistics

LEGEND - Constructs		LEGEND – LISREL Goodness of Fit Statistics			
SDS	(Electronic) Service Delivery System	χ^2 (df); p-value	Goodness-of-fit and probability	Ind.	Independent – no path between constructs
SAT	Satisfaction	CI	Confidence Interval	Std. RMR	Standardized Root Mean Square Residual
VAL	Value	NCP	Non-Centrality Parameter	AGFI	Adjusted Goodness of Fit Index
CON	Control	RMSEA	Root Mean Square Error of Approximation	PGFI	Parsimony Goodness of Fit Index
MAS	Mastery	ECVI	Expected Cross-Validation Index	CFI	Comparative Fit Index
→	influences	Sat.	Saturated – all path between constructs	Critical N	Required sample size for stable model
↑	in the same direction				
↓	in the opposite direction				

Criteria	Guidelines Bryne (1998)	Proposed Model	Alternate Model I	Alternate Model II	Alternate Model III	Alternate Model Iva	Alternate Model IVb
Significant Relationships		SDS→SAT↓ SDS→VAL↓ SDS→CON↓ CON→SAT↑	SDS→VAL↓ CON→VAL↓ MAS→VAL↓ VAL→SAT↓	SDS→SAT↑ SDS→VAL↓ SDS→CON↓ CON→SAT↑	SDS→CON↑ SDS→SAT↑	SDS→SAT↑ CON→SAT↑ SDS→VAL↓	SDS→SAT↑ CON→SAT↑ SDS→VAL↓
χ^2 (df); p-value	Small; Large	9.86 (3); 0.02	56.10 (3); 0.00	1.64 (1); 0.20	21.67 (3); 0.00	10.60 (3); 0.01	1.43 (2); 0.49
χ^2 Null Model	>>Model χ^2	289.77	307.03	289.77	289.77	289.77	289.77
90% CI NCP	0	(0.84, 20.40)	(32.40, 81.24)	(0.00, 8.55)	(7.45, 37.36)	(1.18, 21.54)	(0.00, 0.06)
90% CI RMSEA	< 0.08	(0.052, 0.257)	(0.324, 0.513)	(0.00, 0.288)	(0.155, 0.348)	(0.062, 0.264)	(0.000, 0.177)
p-value: RMSEA < 0.05	> 0.50	0.047	0.000	0.257	0.000	0.036	0.572
Sat. ECVI		0.291	0.291	0.291	0.291	0.291	0.291
Ind. ECVI		2.910	3.078	2.910	2.910	2.910	2.910
90% CI ECVI	< Sat or Ind	(0.270, 0.460)	(0.577, 1.051)	(0.282, 0.366)	(0.355, 0.625)	(0.274, 0.471)	(0.272, 0.344)
CFI	> 0.90	0.977	0.738	0.998	0.928	0.971	1.000
Critical N	> 200	125	16	420	52	106	660
Std. RMR	< 0.05	0.052	0.147	0.024	0.049	0.053	0.022
AGFI	> 0.90	0.816	0.106	0.906	0.612	0.802	0.959
PGFI	> 0.50	0.193	0.164	0.066	0.184	0.192	0.132

Findings

By considering the significance of the path coefficients in the Proposed Model as depicted in figure 4, we can assess the level of support for our hypotheses. Two numbers are listed for each path; the upper number is the coefficient (relative influence of a construct on another) and the parenthetical lower number is the coefficient’s t-statistic (significance). The data indicates that only the hypotheses involving user’s perceived mastery, H3a and H3b cannot be supported. We believe the probable reason for this is related to the demographics of the pilot study sample. The sample population reported homogenous and high values for their self-assessment of this construct as evidenced by the distribution of responses to the questions on Internet usage (visits per day and the number of times the participant has shopped online).

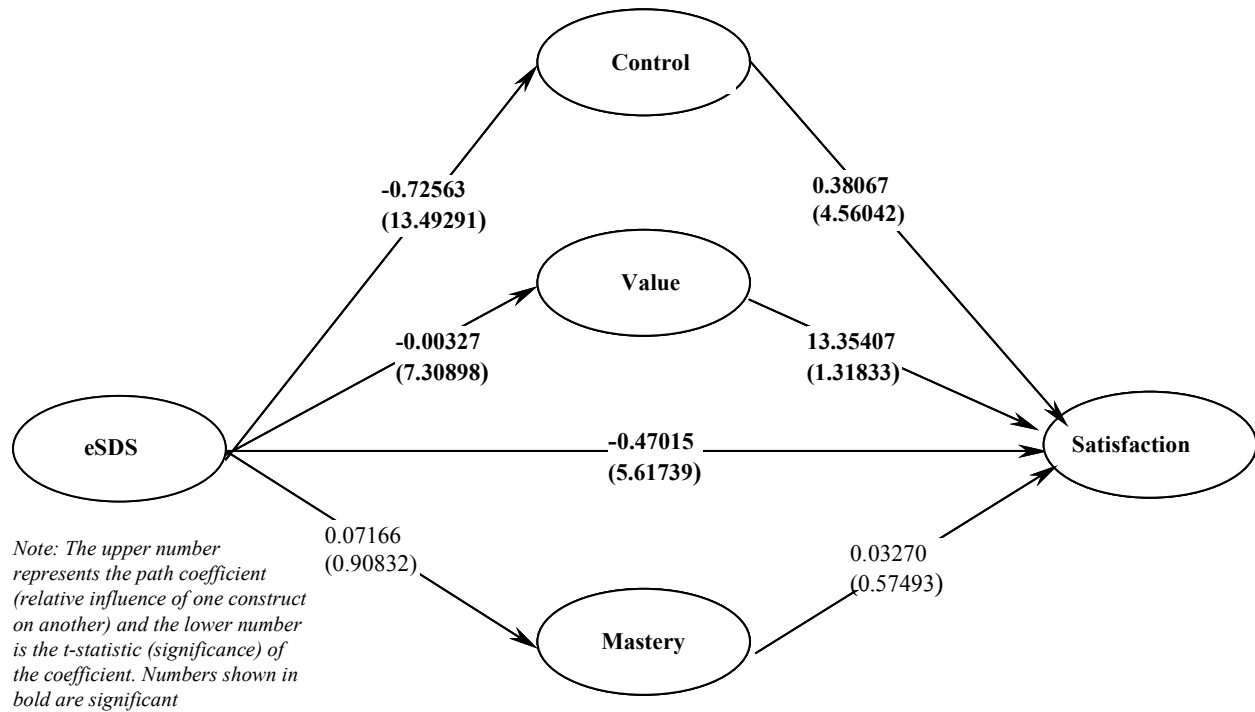


Figure 4. Proposed Model

Conclusion

In this paper we have argued that Electronic Commerce is a type of service and thus can be and should be evaluated through the lens of Service Management. By applying the theories of this field, we have developed four propositions to help guide both practitioners and researchers. Through qualitative research, a theoretical model that explains the drivers of Customer Satisfaction at the buyer/seller interface in the virtual world was formulated. We have tested the hypothesized relationships between the proposed constructs via a self-administered survey. Some empirical support is evidenced by the significance of several of the pathways within the SEM model of our theory. The data collected by the survey can be interpreted to support two extant Service Management models, the Service Profit Chain, and the C-SQ-P model for Electronic Commerce. Through regression of Satisfaction onto Value, the Service Profit Chain is supported and through regression of Satisfaction onto SDS (as a proxy for Interface Quality), the C-SQ-P model is supported. These interpretations also lend support to the theoretical model that we have presented in which satisfaction is driven by the level of the website user’s perception of control and the complexity and divergence of the SDS processes of the website. Although the qualitative phase of this investigation indicated that the user’s perception of technical competence (mastery) is a significant driver of satisfaction, the empirical phase failed to confirm this hypothesis. This inability to demonstrate the significance of this construct may be an artifact of the sample population and further research is warranted.

As ongoing research, several modifications will be incorporated. The intent of these revisions is to address the deficiencies identified herein. In the next phase of our investigation, we have revised the survey instrument to include different extant measures of the constructs taken from the marketing literature in order to obtain higher loadings in the confirmatory factor analysis. The number of measures for each construct was also increased to avoid potential under-identification issues in the SEM analysis. In an effort to determine if the Mastery construct is significant, the size and heterogeneity of the sample is being increased by the inclusion of individuals outside of the setting of an institution of higher education. Although our investigation is anchored in the service management literature stream that utilizes the Expectations-Disconfirmation Model (Oliver, 1989; Tse et al. 1990) of the Satisfaction construct, research based upon other models may provide additional insight for electronic commerce. Among the models of satisfaction found in the Marketing literature are: Attribution (Weiner, 1986); Equity or Fairness (Oliver and Swan, 1989); and Experience-based Norms (LaTour and Peat, 1979; Woodruff et al. 1983).

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